

REMARKS

In the present Application, Claims 1, 9, 45, 46, and 54 have been amended and Claim 44 has been cancelled. As such, Claims 1-2, 4, 7-9, 17-19, 21, 27-32, 43, and 45-56 are currently pending.

The Examiner's objections and rejections are as follows:

- I. Claim 54 was objected to for a typographical error;
- II. Claim 9 was rejected under 35 U.S.C. 112, second paragraph, as allegedly indefinite;
- III. Claims 1-2, 4, 7, 18-19, 27-28, 44, and 54 were rejected under 35 U.S.C. 102(b) as allegedly anticipated by Kroll et al. (U.S. Pat. 6,005,955);
- IV. Claims 8 and 9 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Lesinski et al. (U.S. Pat. 5,772,575);
- V. Claims 17 and 31-32 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Maynard (U.S. Pat. 6,408,496);
- VI. Claim 21 and 29-30 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Miller (Pat. Pub. 2002/0071585);
- VII. Claim 43 was rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll;
- VIII. Claims 46-53 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Berrang et al. (U.S. Pat. 6,516,228); and
- IX. Claims 55 and 56 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Money (U.S. Pat. 5,782,744).

I. Claim 54 Typographic Error

The Examiner objected to Claim 54 for reciting "complaint" instead of "compliant." (Office Action, page 2). Applicants have corrected this typographical error in Claim 54.

II. Indefiniteness Rejection

The Examiner rejected Claim 9 under 35 U.S.C. 112, second paragraph, as allegedly indefinite (Office Action, page 2). In particular, the Examiner asserted that there is insufficient antecedent basis for "said pair of electrically conductive bonding layers" in Claim 9. Applicants

have corrected this typographical error by deleting "a pair" and inserting "at least two" in front of "said electrically conductive bonding layers." As such, Applicants submit that this rejection should be withdrawn.

III. Anticipation Rejection

The Examiner rejected Claims 1-2, 4, 7, 18-19, 27-28, 44, and 54 under 35 U.S.C. 102(b) as allegedly anticipated by Kroll et al. (U.S. Pat. 6,005,955) (Office Action, page 3). Applicants respectfully disagree with this rejection and submit that the Kroll et al. reference does not teach all the elements of Claims 1-2, 4, 7, 18-19, 27-28, and 44 (Claim 54, as discussed below, has been made dependent on an allowable base claim). For example, Claim 1 recites a plurality of electrically conductive bonding layers which are located between the piezoelectric elements. The Kroll et al. reference does not teach the use of electrically conductive bonding layers. The Examiner cites column 6, lines 7-14 of the Kroll reference for teaching bonding layers:

A piezoelectric output transducer is typically implemented as a ceramic piezo electric bi-element transducer, which is a cantilevered double plate ceramic element in which two opposing plates *are bonded together* such that they amplify a piezo electric action in a direction normal to the bonding plane. Such a bi-element transducer vibrates according to a potential difference applied between two bonded plates.

As seen in the cited text, the Kroll et al. reference simply indicates that the piezoelectric elements are "bonded together." There is no indication that a "layer" is formed between the piezoelectric elements, let alone that a layer is formed that is "electrically conductive." Instead, the use of "bonded together" implies the use of an adhesive that does not form a "layer" and that would not be "electrically conductive." The figures in Kroll et al., such as Figure 11, show that no "layer" is formed between stacked piezoelectric elements. Figure 11A is reproduced below to show that no "layer" is formed between each of the piezoelectric elements, such as between parts 140A and 140B, or between parts 145A, 145B, and 145C.

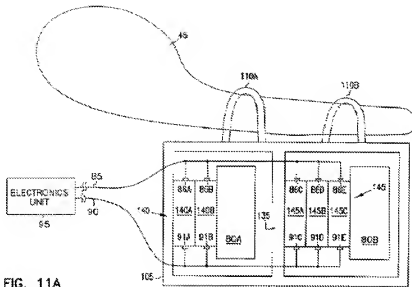


FIG. 11A

In light of the above, it is clear that the Kroll et al. reference does not teach the use of "layers" between piezoelectric elements, and certainly does not teach such layers that are "electrically conductive." As such, Applicants respectfully request that this rejection be withdrawn.

Despite the fact that the Kroll et al. reference does not anticipate the claims, to expedite the prosecution of the present application (without acquiescing the Examiner's rejection), Applicants have amended Claim 1. In particular, the vibrational assembly has been amended to further comprise:

- b) a plurality of wires, wherein at least one of said wires is attached to each of said electrically conductive bonding layers

This amendment incorporates the limitations from dependent Claim 44 (which has been cancelled). Applicants submit that Kroll does not teach the use of wires between electrically conductive bonding layers. First, as explained above, Kroll et al. does not teach electrically conductive bonding layers, so it cannot teach attaching wires to an element that is not taught. Second, the wires cited by the Examiner against Claim 44 (wires 85 and 90) attach to the piezoelectric elements themselves, not to any region between the piezoelectric elements. This is shown in Figure 11A reproduced below where the wires are not located at the junction between the piezoelectric elements, but instead are attached to the piezoelectric elements themselves:

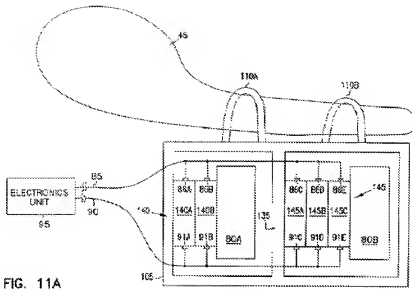


FIG. 11A

In light of the lack of teaching of wires attached to electrically conductive layers between the piezoelectric elements, Applicants submit that this is an additional reason that the Kroll et al. reference does not anticipate the claims.

IV. Obviousness Rejection of Claim 8 and 9

The Examiner rejected Claims 8 and 9 under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Lesinski et al. (U.S. Pat. 5,772,575) (Office Action, page 4-6). Applicants respectfully submit that this rejection is moot in view of the amendments to the claims and the general lack of teaching of Kroll et al. For example, Kroll et al. does not teach "electrically conductive bonding layers" and does not teach a "plurality of wires, with at least one of the wires attached to each of the electrically conductive bonding layers." The Lesinski reference cited by the Examiner do not makes up for the lack of teaching in the Kroll et al. reference.

It is noted that the Examiner, asserted that the Lesinski et al. reference teaches "conductive bonding layers" citing parts 45a and 45b from Figure 3 (Office Action, page 5). Applicants submit that Lesinski et al. does not teach conductive bonding layers between piezoelectric elements. In particular, neither 45a nor 45b in Figure 3 is a conductive bonding layer. Instead, there two elements *are* the piezoelectric element that make up "part 45." As described at column 11, lines 43-53, 45a is part of PLZT piezoelectric element that has not been oxidized, and part 45b is part of the *same* PLZT piezoelectric element that has been oxidized to

form a conductive cermet layer. The two elements are part of the same PLZT "unimorph," which is labeled "part 45." In other words, there is no bonding layer between 45a and 45b as they are part of the same piezoelectric element. Figure 3 below shows schematically that parts 45a and 45b are part of the same piezoelectric element, which is labeled as "part 45."

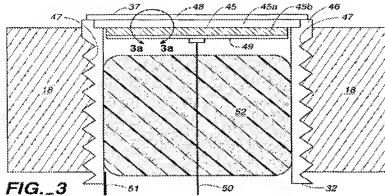
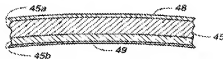


FIG. 3a



Moreover, it is noted that parts 48 and 49 are electrodes (not other piezoelectric elements). As parts 48 and 49 sandwich part 45, it is clear that there is no "stack" of piezoelectric elements, and certainly none with a conductive bonding layer in between elements. As such, it is clear that the Lesinki reference does not teach "electrically conductive bonding layers" (and certainly none *between* piezoelectric elements) and therefore does not make up for the lack of teaching of the Kroll et al. reference. As such, Applicants submit that the claims should be allowed.

V-VII. Three Obviousness Rejections

The Examiner issued the following three obviousness rejections: 1) Claims 17 and 31-32 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Maynard (U.S. Pat. 6,408,496); 2) Claim 21 and 29-30 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Miller (Pat. Pub. 2002/0071585); and 3) Claim 43 was rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll (Office Action, pages 6-8). Applicants respectfully submit that these three rejections are moot in view of the amendments to the claims and the general lack of teaching of Kroll et al. For example, Kroll et al. does not teach "electrically conductive bonding layers" and does not teach a "plurality of wires, with at least one of the wires attached to each of the electrically conductive bonding layers." The

secondary references cited by the Examiner do not makes up for the lack of teaching in the Kroll et al. reference. As such, Applicants submit that these rejections should be withdrawn.

VIII-IX. Two Obviousness Rejections

The Examiner issued the following two obviousness rejections: 1) Claims 46-53 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Berrang et al. (U.S. Pat. 6,516,228); and 2) Claims 55 and 56 were rejected under 35 U.S.C. 103(a) as allegedly obvious over Kroll et al. in view of Money (U.S. Pat. 5,782,744) (Office Action, pages 8-10). Applicants have amended these claims, making them dependent on allowed Claim 45. As Claim 45 has been amended into independent format, and since Claim 45 has been allowed, these two obviousness rejections are moot.

CONCLUSION

Should the Examiner believe that a telephone interview would aid in the prosecution of this application, Applicants encourage the Examiner to call the undersigned at 608-218-6900.

Dated: January 28, 2008

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